

THE S-EIGHTY™



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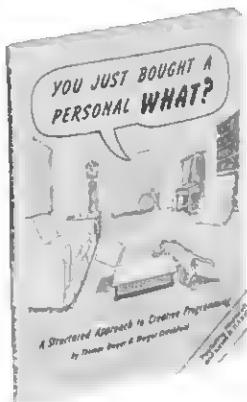
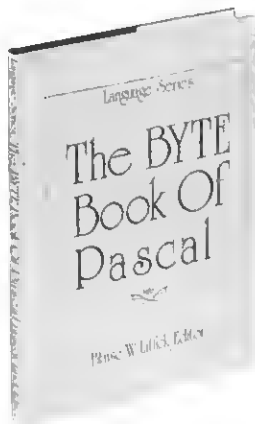
The BYTE Book of Pascal

Edited by Blaise W. Liffick

Based on the growing popularity of Pascal as a programming language, numerous articles, language forums and letters from past issues of BYTE magazine have been compiled to provide this general introduction to Pascal. In addition, this book contains several important pieces of software

including two versions of a Pascal compiler - one written in BASIC and the other in 8080 assembly language; a p-code interpreter written in both Pascal and 8080 assembly languages; a chess playing program; and an APL interpreter written in Pascal.

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by Thomas Dwyer and Margot Critchfield

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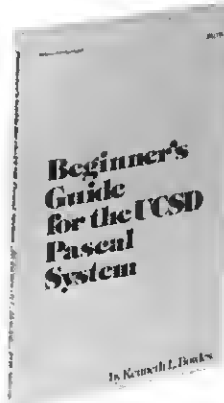
Beginners Guide for the UCSD Pascal System

by Kenneth Bowles

Written by the originator of the UCSD Pascal System, this highly informative book is designed as an orientation guide for learning to use the UCSD Pascal System. For the novice, this book steps through the System bringing the user to a sophisticated level of expertise. Once familiar with the System, you will find the guide an invaluable reference tool for creating advanced applications. This book features tutorial examples of programming tasks in the form of self-study quiz programs. The UCSD Pascal Software Systems, available from SofTech Microsystems Inc, 9494 Black Mountain Road, San Diego CA 92126, is a complete general purpose software package for users of microcomputers and minicomputers. The package offers several interesting features including:

- Programs which may be run without alteration on the General Automation or DEC PDP-11 minicomputers, or an 8080, 8085, Z80, 6502, 6800, or 9900 based microcomputers.
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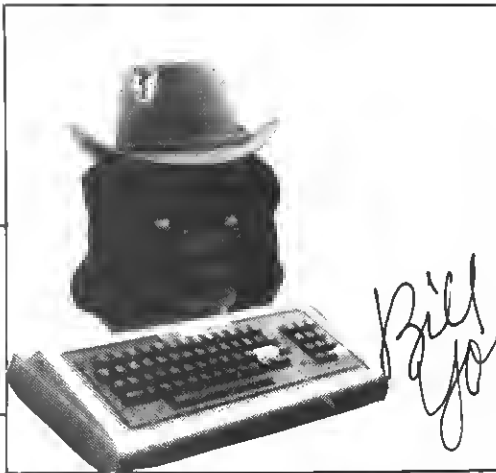
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PURE & SIMIAN

I come to you not as a prophet.....

Expansion, growth, profit...these have become watchwords for the microcomputer industry, and they appear to be causing negative reaction and results in some areas of our industry. A company can indeed outgrow itself, overextend its capital in money and people, cut its promotional budget so as to skip a month here and there, and suddenly said company finds that it doesn't exist on a competitive scale. I don't think that many people anticipated the industry to soar as it has...no matter what some people say...as sales increased we increased our promotions, orders increased, we hired additional people to meet the workload and suddenly WE COULDN'T FIND ANY COMPUTERS!! We had finally reached the point where the manufacturer couldn't keep up with the demand, and the backorder became the order of the day. This started from the computer itself, all the way to I.C's.

With this issue, we have refused an advertiser who was offering a major hardware item at 8% over cost. We admit that the low price had a part in the decision, but upon checking with the company we did not find sufficient capitalization to cover repairs and product support which we know will cost more than the \$25.00 markup...not to mention advertising costs and normal operating overhead. A deal that puts your supplier out of business is not our idea of a bargain.

A New England-based chain of computer stores is reported to be in dire straits. They started with one large store and grew to several branches, but have recently sent a group of employees packing, and are behind in payments to creditors.

There is much to be learned and earned from the micro industry, and I guess the only way is through the mistakes of others. Being overzealous (and who isn't when it comes to the almighty buck) can put your business in the red before you realize it. Good marketing strategy and support, good product support and competitive pricing are what it's all about. Once you go beyond the financial constraints of your business, you're headed for trouble. There are many informative publications to scan that are loaded with good financial and marketing information; some are Changing Times, Forbes, Consumer Reports, and many others.

RIP OFF! seems to be a popular part of the lingo of today...I'll bet George Carlin could do a couple of hours on it. We are very interested in the consumer aspect of our industry, and are considering a column devoted to exposing companies who appear to be fraudulent, and a column to praise companies who are doing business on a first-rate basis. The only way I can find out about the good companies, (I'll dig up the bad ones) is from your input. Let me know about your experiences with various manufacturers and vendors. If you have a good experience, let us know...if you've had a bad experience, let us know even faster so we can save someone else from the same debacle. We'll also provide you with hints on

what recourse is available when you feel that you have been taken.

SAN FRANCISCO

I left my heart, money, appetite and a couple of unmentionables in San Francisco and never had a better time in my life! I am referring, of course, to the West Coast Computer Faire #5 which took place the 14th-16th of March. I have been an exhibitor in four of five shows and can quite honestly say that this year was far better than any in history. Almost 20,000 people filed through Brooks Hall and the Civic Auditorium and almost 20,000 people bought something along the way.

San Francisco is filled with magic for anyone who visits...from its fabulous restaurants to its beautiful scenery...and what a place to have a computer faire.

Most of you are familiar with George Blank, our Managing Editor here at SoftSide Publications. George had eight cases of a new publication which he thought the Faire attendees might like to see, so rather than sell them at cover price, George thought "Let's sell them at 5¢ each!". Well!...at the end of three days, we had \$175.00 worth of nickles and the City of San Francisco is now sitting two inches higher in the bay. I once thought of George as insane...now I regard him as a good friend. In spite of the humor here, it perfectly describes the response of the visitors to booths as they made their way around the show.

Jim...you've done it again and my hat's off to you. A very nice job and a fabulous faire. See you next year...with a much larger crew.

CURRENT EVENTS

MITA (Microcomputer Industry Trade Association) seems to be off and running in good shape. They now have a spokesperson in Washington and are looking toward a MITA show and several other interesting and vital projects.

I normally come away from a show with at least one shocking bit of news, but this year the news seems to be much as expected...Radio Shack is falling way behind its competition. North Star*, Ohio Scientific*, Atari*, APPLE* and several others are rapidly passing Radio Shack in quality and support in all levels. Many companies that I know of...including ours...are considering dropping the TRS-80 before it's too late. Graphics, color and mainframe are taking their toll on the Model I from Fort Worth.

Spring is just around the corner! See you in May.

Cover photograph by Elaine Cheever

COVER CONTEST
Win a year's worth of SoftSide on
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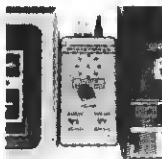
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The Micro-Mega Cassette Control Unit does a lot to improve the appearance of your TRS-80 system, too. As shown, it's in a 2 1/2" x 5" box which snugly fits between the keyboard and your recorder. There is no need to move the recorder, and all cables come neatly into the unit. The Cassette Control Unit is tailored to the CTR-41 recorder, but may be used with most other recorders as well.



CASSETTE CONTROL UNIT..... \$37.95
Add \$1.00 for postage and handling

CPU MONITOR

Ever find yourself with a blank screen wondering what your computer is up to? The Micro-Mega CPU Monitor can tell you, for example: • If your CPU is in a loop with no exit, • When a long sort is nearing completion, or • If a key bounces during keyboard input. The CPU Monitor lets you listen to all CSAYEs and CLOADs and will help you quickly find the correct recorder volume setting, if you have an expansion interface, you will always know whether the real-time clock is on or off because you can hear it.

The Micro-Mega CPU Monitor gives a voice to the Z-80 microprocessor in your TRS-80 by using AM radio circuitry to pick up the computational rhythms of the CPU, which are amplified and played through a loudspeaker. The pickup unit of the CPU Monitor, shown at left in the photo, goes under your TRS-80 keyboard. It is connected by a 36" cable to the speaker and control unit, which includes an on/off volume control and an LED "power-on" indicator. The Monitor is powered by an AC adapter, shown at right in the photo. No batteries are needed and no electrical connections to your TRS-80 are required.

By listening to the CPU Monitor, you will soon become familiar with the "personalities" of the programs you run and whether they are executing in a normal way. A dramatic use of the CPU Monitor is in the great enhancement which it provides for computer games. (See "Gaming Environment" below.)

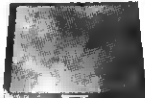


CPU MONITOR..... \$47.95
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THE GREEN-SCREEN

The eye-pleasing Green-Screen fits over the CRT of your TRS-80 Video Display and gives you improved contrast with reduced glare. You get bright, luminous green characters and graphics like those featured by very expensive CRT units.

The Green-Screen is closely matched to the color and texture of the TRS-80 Video Display and improves the overall appearance of your system. It is attached with adhesive strips, which do not mar your display unit in any way. The Micro-Mega Green-Screen gives improved video display visibility for all applications and is especially effective in creating dramatic, high-impact displays for computer games. (See "Gaming Environment" below.)



THE GREEN-SCREEN..... \$13.95
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THE ULTIMATE STAR TREK PACKAGE

Tired of trivial computer games? This complete Star Trek package will provide you with endless fascination and challenge. In addition to the program cassette, it includes comprehensive instructions, a pad of "Voyage Log" record sheets, and a free standing "Torpedo and Maneuvering Chart".

The package is built around the latest version of Lance Micklus' incomparable Star Trek III, a 13,000 byte program with a host of subtle and imaginative features, which include numerous dynamic and spectacular graphic displays. Star Trek III puts you in command of the Enterprise cruising in a galaxy of 192 quadrants filled with uncharted hazards, including hostile Klingons, pulsars, and black holes. You have at your disposal scanners, various weapons and defense systems, on-board computers, and a loyal crew. (You will need them all to survive the Klingons.)

Your mission is to raid the region of Klingons and to locate live inhabitable planets, all within 300 star-days, before returning to Star Fleet Headquarters where your overall effectiveness as a starship commander will be scored. High scores are possible only with careful planning and effective battle tactics. The "Voyage Log" sheets will guide your strategy, and the "Torpedo and Maneuvering Chart" will give you a vital edge in combat. (When you engage three Klingon ships you can't afford to miss.)



STAR TREK PACKAGE (for Level II, 16K only)..... \$22.95
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The Enterprise is in battle trim with deflector shields at full power. As her captain, you are taking her into combat. The battle stations siren rings in your ears and "CONDITION RED" flashes on your monitor screen. You call for warp drive and key in the coordinates of the quadrant where your scanners have detected Klingon ships. As you select the warp factor, you hear the reassuring clicking of your navigational gear as it activates the warp drive.

Suddenly, you break out of hyperspace and your monitor displays the chilling sight of three Klingon Battle Cruisers floating on your screen. The evil shapes glow in luminous green against the black void of space. Moments later, you hear the characteristic rasping sound of Klingon laser weapons, and, as you watch, high-energy beams come knocking toward the Enterprise in succession from each of the Klingon ships.

You have been hit! You hear the dismal sound of the damage control alarm as "DAMAGE TO WARP DRIVE" and "DAMAGE TO PHASERS" flash on your screen. The Klingons have stopped firing! The Enterprise is crippled, but your best weapon is still intact, and it's your turn now! You key in the command for photon torpedoes. As your screen again displays the position of the Klingon ships, you select a firing vector from your torpedo chart and key it in. Now you hear the buzz of your photon torpedoes as you see it speeding toward a Klingon ship. It strikes him dead-center! As you watch, the Klingon Battle Cruiser disintegrates, accompanied by a satisfying crackling sound.

Does the above scenario sound far-fetched? Not at all! It is a small sample of what you will experience with Micro-Mega's Gaming Environment, which consists of: • The STAR TREK PACKAGE • The GREEN-SCREEN and • The CPU MONITOR. The fast-paced and dynamic action reflects the superb Star Trek III program, together with the "Voyage Log" and "Torpedo Chart" of the Star Trek Package. All of the unique graphic displays are greatly enhanced by the Green-Screen. Finally, the uncanny sound effects are produced by the CPU Monitor, which faithfully picks up the FOR, NEXT loops and other CPU patterns, which create the distinctive siren sounds that accompany the ALERT and DAMAGE messages along with the harsher notes of the weapons salvos. Once you've tried it, you won't any longer be satisfied with silent computer games.

Remember that with the Gaming Environment you also get all of the other excellent features of the CPU Monitor and the Green-Screen for non-gaming applications. You also save \$5.00 off the combined cost of the individual items.

GAMING ENVIRONMENT..... \$79.95
Add \$3.50 for postage and handling

Terms: Check or money order, no CODs or credit cards, please. Add amount shown for postage and handling to price of the item. All items shipped within 48 hours by first class or priority mail. Virginia residents, add 4% sales tax.

✓29

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WE MEAN BUSINESS!

BUSINESS SOFTWARE, THAT IS

USE YOUR TRS-80* FOR MORE THAN FUN AND GAMES

THE DATA DUBBER \$49.95

Duplicates any program tape to TRS-80 quality. Reconstructs date pulses to ensure accurate CLOADs. Permits easy loading of even poor quality commercial tapes with out constant volume adjusting. Money-back guarantee if not satisfied.

THE ELECTRIC SECRETARY \$75.00

A powerful word processor to turn your TRS-80 into an automatic typewriter. Features page numbering, movable margins, headers, variable page length, and title centering. Enter text, revise, correct, and output to printer page formatted, justified, even hyphenated as required. Cross-coupling files permits individually addressed form letters. Complete with upper/lower case conversion information on diskette. Specify if RS232 adapter is installed in interface.

MAILROOM PLUS \$75.00

A versatile and powerful mailing program to print labels by sequential coding: zip, city, state, customer ID code, even last name. Sorts by any code in minutes and stores sequentially in a single string (approx. 1500 records per diskette). Includes AUTOPRINT. Supplied on diskette.

MINIMAIL \$50.00

A compact version of MAILROOM PLUS but without customer coding. Features alpha-lookahead for duplicates. Supplied on diskette.

FORMLET \$35.00

Generates form letters from MINIMAIL records. Prepare your letter, bulletin, notice, advertisement, etc., then load the MINIMAIL files. Your printer will print the inside address, letter, and repeat for each name in the file—all properly spaced and justified. Supplied on cassette.

AUTOBOOT \$15.00

Simplifies automatic BASIC program loading from your DOS. Permits sequencing through your choice of DOS commands, selects files and memory size you specify, and loads or runs selected program. Allows user to see directory and free space before program runs automatically. Supplied on cassette.

SIR ECHO \$10.00

A handy program to make your printer work like an electric typewriter. Use alone or merge with your programs to make what appears on the screen echo to the printer. Supplied on cassette.

TELEFON \$20.00

Make your TRS-80 a smart terminal. Communicate with time-share and other computers, bulletin boards, etc. Transfer programs over the phone. For disk systems with modem.

UPPER/LOWER CASE CONVERSION \$20.00

Reprint of KILBAULD article explaining how to modify the TRS-80 to display both upper and lower case characters. Kit contains step-by-step instructions, parts, and necessary software on cassette for case reversal, echo, and automatic line feed routines.

User group discounts available
Dealer inquiries invited.

*TRS-80 is a trademark of the Tandy Corp



TERMS: Check, money order, Visa, MasterCard. Washington residents add 5.3% for tax.



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READER SERVICE R

New Products

The S-EIGHTY is happy to publish information about new products related to the TRS-80*. We cannot be responsible for the accuracy of the information presented here, and those with questions are asked to contact the indicated companies directly.

*Trademark of Radio Shack Div. of Tandy Corp.

DON'T BLAME THE SOFTWARE

Crashes, memory loss and program glitches are often caused by AC power line hash and surges. Peripheral and processor equipment interaction also contribute to program woes.

To combat these problems, Electronic Specialists has expanded its Isolator line. Model ISO-2 comprises two filtered banks of 3-prong AC sockets (6 sockets total) with integral surge suppression. Each socket bank is filter isolated from the other bank and from the AC power line.

Intended for MicroProcessor systems with limited processor-peripheral interaction problems, the Isolator Model ISO-2 also provides isolation from disruptive and expensive AC power line surges and hash. Applications include precautionary installation to

isolate portions of the system, with the entire system isolated from AC power line hazards.

Connecting to the 125 VAC power line with a standard 3-prong plug, Model ISO-2 can isolate and protect an 1875 watt total load, with each socket bank capable of isolating a 1000 watt load.

Interaction, Surge and Hash Isolation for only \$54.95.

Electronic Specialists, Inc.,
Box 122, Natick, Ma. 01760.

RADIO SHACK TRS-80 EXPO '80

"The business and educational computer show of the decade," TRS-80 Expo '80, is being brought to more than 50 cities, primarily major market areas, by the nationwide Radio Shack electronics store chain.

Expo '80, according to Radio Shack, is a business and educational computer show designed to acquaint small businessmen, educators and professional people with the value of modern computer technology, and to demonstrate the use of Radio Shack's line of TRS-80 microcomputer systems.

Visitors to Expo '80 will be able to see a multi-media presentation and participate in a "hands-on" demonstration that shows how easily a TRS-80 microcomputer can be programmed.

The new TRS-80 Model II Business Computer will be on display as well as Radio Shack's famous TRS-80 Model I Microcomputer System, acknowledged as the world's bestselling microcomputer.

Radio Shack computer experts will be on hand to answer questions and demonstrate new software programs including: Educators Math K-8, Word Processing, Standard & Poor's "Stockpak!" Stock Selection System and Portfolio Management System, Business Inventory, Business Accounts Receivable, and various personal applications.

Visitors to Expo '80 will have an opportunity to participate in a free drawing to win a \$499.00 TRS-80 Model I 4K Level I Microcomputer System. No purchase necessary. In addition, each person attending will receive a certificate good for a free computer language course, worth up to \$49.95, at any Radio Shack Computer Center.

Radio Shack, a division of Tandy Corporation, manufactures the TRS-80 line of microcomputer systems in Fort Worth, Texas. TRS-80 microcomputers are sold by more than 7,000 Radio Shack stores and participating dealers, and over 50 Radio Shack Computer Centers, coast-to-coast.

LOBO DRIVES OFFERS ENHANCED EXPANSION INTERFACE FOR TRS-80* COMPUTERS

Goleta, CA...Lobo Drives, International, manufacturers of floppy disk and hard disk memory systems for the personal and small business microcomputer market, today announced the addition of an enhanced expansion interface for the Radio Shack TRS-80 computer.

Identified as the Model LX80, the new expansion interface has been designed for the serious user who wants to improve and expand the performance and capabilities of the TRS-80. It offers many improvements and several new features not available on the standard Radio Shack model.

The Lobo Drives Model LX80 enhances system performance by expanding memory storage capacity up to 40 million bytes. It provides facilities for up to 32K of RAM and offers a second serial port. An easily accessible switch permits overriding the keyboard ROM for booting in diagnostics and customized operating systems.

Connectors for the 5.25 and 8-inch floppy disk drives and other peripheral devices are conveniently located on the side and rear panels. There is a separate, bidirectional parallel



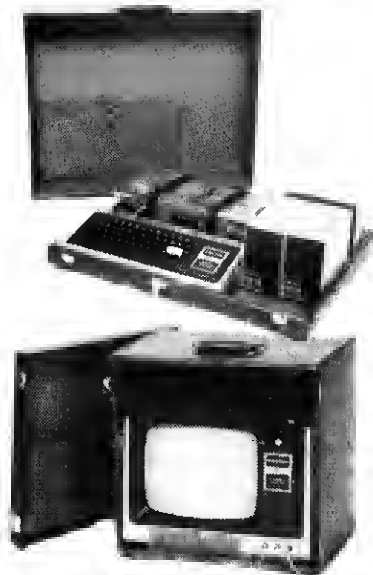
port exclusively for the Lobo Drives Model 7710T Winchester hard disk drive.

Other features include: a parallel "Centronics" printer port, screen printer port, two microprocessor-controlled bi-directional serial ports, and a crystal controlled "Real Time" clock.

The Model LX80 Expansion Interface is priced at \$525 quantity one, with dealer discounts available. Shipment is 45 days ARO.

For additional information, contact Mike Mock, Lobo Drives, International, 935 Camino Del Sur, Goleta, CA 93017. 805-685-4546 or 714-641-1436.

*TRS-80 is a trade mark of Radio Shack, a Tandy Corporation.



A set of attache-style carrying cases for the TRS-80 computer has been introduced by Computer Case Company of Columbus, Ohio. The basic case will hold the keyboard computer, the expansion unit, recorder, and a tape recorder or up to two disk drives in a fully operational configuration. No need to disconnect and reconnect cables each time the computer is moved. Simply plug in the power cable, connect the monitor and operate. A power strip is also provided so that all the equipment can be powered from a single source. The removable lid has storage space for manuals, disks, working

papers and other necessities. The computer and disk drives (or tape recorder) are held in position with security straps and cradled in foam rubber for protection while operating, transporting or in storage. The cases are constructed of high quality luggage material covered in a rich brown leather-like scuff resistant saddle-stitched vinyl with padded handle, lock, furniture protecting pads and steel skids. Truly a quality piece of workmanship.

By using the optional RF-modulator any TV set can be used as a monitor, making it unnecessary to transport the monitor. A case is also available which will carry the monitor along with other accessories such as a modem or miniprinter for those who wish to transport a fully operational system. A separate case is also available for the Line Printer II.

The cases provide not only portability but a convenient method of storage free from possible damage and dust accumulation. By replacing and locking the lid, the computer and software are protected from tampering and unauthorized use. Access is controlled without the necessity of dismantling the setup. Delicate cables are protected from possible inadvertent damage or failure due to repeated connecting and disconnecting.

The cases are available from Computer Case Company, 5650 Indian Mound Court, Columbus, Ohio 43213 and will soon be available at most computer stores. Phone orders will be accepted from credit card buyers 614-868-9464.

ON-SCREEN LIST MAKER HOLDS 400 NAMES AND CODES IN 16K

The Listmaker, from Manhattan Software, is designed for the TRS-80 owner who

wants maximum name-and-code listing capacity, with program flexibility, within a 16K memory limitation, and with tape-only storage. Up to 400 names or items with codes can be entered into memory, with 5-digit codes (numbers, letters or mixed) to allow detailed identification of groups of names. The program will list all names on-screen or to printer, list names in a specific 5-digit code, or names by first digit only, or first two, three or four digits.

The program sorts names alphabetically, finds and displays any name for review. It saves to applications for editing of name or changing code, or for deletion and memory recovery. It saves to tape and loads lists from tape. Suggested applications are for clubs, organizations, small businesses or individuals who want to retrieve selected lists by specified code, in seconds, from a large listing of names. Other uses include listing of books, records and other items by category. For TRS-80 Level II 16K. \$9.95

Manhattan Software, Inc.
P.O. Box 5200 Grand Central Station, NYC, NY, 10017.

RANDOM FILE DISK SORT/MERGE FOR THE TRS MOD-I/II

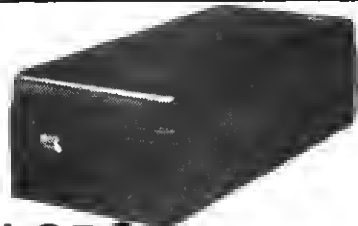
A new disk sort/merge system "DSM" is now available for both the TRS Mod-I and Mod-II. DSM is a self contained system written entirely in machine language ready for immediate use. DSM has many powerful features. DSM:

- ☐ Sorts large multiple diskette files on a minimum one drive Mod-II or two drive Mod-I disk system.
- ☐ Physically rearranges all records — no key files are required!
- ☐ Sorts random files created by BASIC, including sub-records spanning sectors.

- Sorts on one or more fields in ascending or descending order. Fields may be character, binary integer or floating point.
- Provides optional output field deletion, rearrangement, and padding.
- Sort commands can be saved for re-use in production applications.

This system is perfect for large mailing lists, inventory control, and other business applications. Sort times are very fast (16K-33 sec., 32K-49 sec., 85K-173 sec., 170K-445 sec., 340K-1081 sec., 680K-2569 sec.). Sort timing includes Disk Input/Output. Mod-II times are twice as fast!

DSM is available from RACET COMPUTES, 702 Palmdale, Orange, CA 92655, 714-637-5016 for \$75 (Mod-I version) or \$150 (Mod-II version).



LOBO DRIVES INTERNATIONAL

**LOBO DRIVES
ANNOUNCES
10 MEGABYTE
WINCHESTER
HARD DISK
MEMORY SYSTEMS
FOR APPLE, TRS-80*,
AND S-100 BUS
COMPUTERS**

Goleta, CA...Lobo Drives, International, one of the industry's leading manufacturers of floppy disk and hard disk memory systems for the personal and small business microcomputer market, today announced the addition of three 10 Megabyte Winchester technology hard disk memory systems to its growing product line.

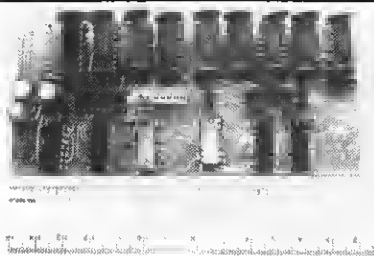
Identified as the Lobo Model 7710 T,A,S (T for TRS-80, A for APPLE, and S for S-100 computers), the new memory system is a breakthrough in disk storage technology. It provides the serious computer

user with an extremely cost-effective way to add 10 Megabytes of high speed mass storage. The Model 7710 comes complete with the highly efficient, highly reliable IMI 7710 Winchester technology disk drive, Lobo intelligent controller, precision power supply, interface, and related software.

The Lobo Drives Model 7710 is completely compatible with most TRS-80, APPLE, and S-100 disk operating systems, and requires little or no changes to system software to operate. Most applications software designed to operate with these computers and floppy disk drives will run with all the increased speed and convenience the Model 7710 can provide.

It is virtually interchangeable with standard floppy disk drives and can be rack/slide mounted vertically or horizontally, or may be placed on a table top.

The Lobo Drives Model 7710 is an extremely cost-effective way to increase the efficiency and performance of most microcomputers. Quantity one prices begin at \$4995, and volume discounts to dealers are available. Delivery is 45 days ARO. For additional information, contact: Mike Mock, Lobo Drives, International, 935 Camino Del Sur, Goleta, CA 93017. 805-685-4546 or 714-641-1436.



TRS-80* GETS A SPLIT PERSONALITY

F.E.C., Ltd., Box 2368, Woburn, MA. 01888 617-944-5329 has announced two new products. The first is a circuit board and software (Operating System) that converts the TRS-80* upon software command to a "real" CP/M** type machine, that loads programs at Hex 100

and responds to Call 5. The disk format is changed to a 128 byte, 18 sector I.B.M. format, instead of the 256 byte sector format of the TRS-80*. When switched to the Freedom Mode (F.E.C.'s version of CM/M**), the TRS-80* really changes its personality. Freedom Mode supports both serial (through the RS232 board) and parallel printers. The Operating System supports both 35 and 40 track disk drives. Freedom Mode permits compatibility with other Z-80 based machines (such as the Cromemco Model 2) that use 5 1/4" disks. Best of all, this change is pluggable and totally transparent, while running in TRS-80* mode.

The second change is: Expansion Memory. In the Freedom Mode, the ROM is no longer used, and there is room to address 14848 additional bytes. The Expansion Memory fills this gap and increases the addressable RAM to a full 64K bytes. This memory is structured to account for the memory-mapped areas of the keyboard, screen and I-O functions.

MEDIAMIX

Media mix announces the release of PSRJ+2.0 for use with their IBM Model 50 Type-writer/TRS-80 interface. This machine language program prints out an Electric Pencil text file (or any ASCII file) using the IBM 50's proportional spacing type elements, with full right justification. The user can imbed codes in the text for centering of titles, indenting paragraphs, underlining, typing special characters (² ³ ½ ¼ §) and pauses during printing to allow changing type fonts for titles, italics etc. "Intelligent hyphenation" is also available during printing. The net result is a typesetting system ideal for brochures, instruction manuals, "job getting" resumes, and press releases! Contact: Mediamix, P.O. Box 8775, Universal City, California 91608, 213-475-9949.

THERE IS A DIFFERENCE IN TRS-80 DISK DRIVES CAPACITY

Expansion interface – gives your TRS-80 the disk capacity it needs, and much, much more!

10 to 40 MByte, 8" Winchester drive – expands capacity far beyond Model II storage.

Single sided minifloppy – up to 150 KBytes of storage capacity.

Single or double sided 8" floppies – up to 2.5 MBytes in dual drive cabinet – for the serious TRS-80 user.

NOW: ALL DRIVES COMPATIBLE WITH MODEL II

LOBO DRIVES' new family of disk memory products provides you with a choice of memory capacities you need to effectively execute the complex business software you've developed for your TRS-80*. LOBO DRIVES' selection of readily available, software compatible drives permits you to expand your inventory, payroll, customer list, and accounts receivable files as your business grows.

And LOBO DRIVES brings you more... a new plug-in expansion interface that provides an easy way to add hardware enhancements, communications capability, and programmable features... and it comes with the LOBO DRIVES famous 1 year, 100% parts/labor warranty.

Call or write for the complete LOBO DRIVES story. Find out just how competitively priced a family of high capacity drives can be...



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Single sided
Double sided | <input type="checkbox"/> Double density
expansion interface |

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If dealer, provide resale no.

*TRS-80 is a registered trademark of Radio Shack, a Tandy Company.

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 TRS Disk and other Mysteries by
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*TRS-80 is a trademark of the Tandy Corporation.

To order by phone or for local dealer information call: **713/661-2005**

Texas residents add 6% sales tax • MasterCard • Visa

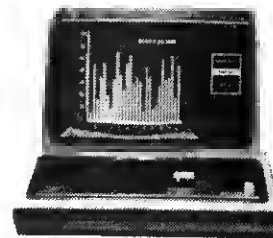
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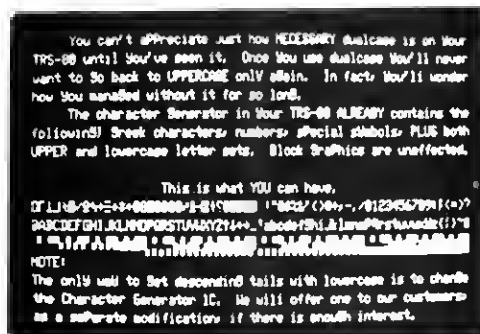
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READER SERVICE I

WHY LOWERCASE?



Wouldn't you like access to YOUR entire typeset? Level II Basic converts lowercase command words into UPPERCASE. All characters contained between quotes remain as typed, but the software in an unconverted TRS-80 allows UPPERCASE display only! This software shortcut allowed Tandy to omit one video memory chip. This chip must be added and the video software repaired before the display of dualcase is possible.

(Print or Type)

Name _____

Street _____

City _____

Zip _____

Master/Visa # _____

Expiration Date _____

Signature _____

Unfortunately,
converting your TRS-80 requires installing the video memory chip plus wiring changes. There is only one modification on the market which eliminates most of the wiring. To get the dualcase mod installed you have three choices: 1) Send your computer to a company or individual who will do the wiring, 2) do it yourself, or 3) "THE PATCH"

To make choices 1 & 2 operate requires using software overhead in the form of a "driver". This takes 30 bytes, unless you want a "normal" shift to UPPERCASE keyboard. That takes upwards of 60 more bytes. Software oriented mods have three more disadvantages: 1) They reside in program memory, eating program space which you could be using, 2) other machine language programs are unusable if they are loaded against the top of memory, or 3) the "driver" software MUST be loaded every time you power-up, or the "MEMORY SIZE?" appears due to program bomb. Choice number three suffers from NONE of the software overhead problems. We call it "THE PATCH" and it's new for the 80's!

"THE PATCH", a small electronic module which plugs into the unused ROM socket on Level II machines, makes necessary software changes to ROM supporting lowercase, an optional block cursor, & extra keyboard debounce. Electronically means NO software overhead. Your computer displays lowercase instantly upon power-up, and the keyboard operates in "normal" typewriter fashion.

"THE PATCH" is completely compatible with your TRS-80 since it is the first, and only, TRS-80 lowercase system designed that flawlessly mates with the computer as a unit, not just a special program package.

"THE PATCH" is also the only modification of any kind which can have extra options and updates factory installed for 5 to 19 dollars per option, as they are available. Same day turnaround.

Order yours today to avoid extra delay. Send \$59.97 + 2.50 for S&H to: CECOAT "THE PATCH" / Box 8963 / Moscow, ID 83843.

THE PATCH is a Trademark of CECOAT, Inc.

TRS-80 is a Trademark of Tandy Corp.



___ aa "THE PATCH" 59.97
Ship & Handling + 2.50

___ aa Block Cursor
(Replaces Underline Cursor)

N/C

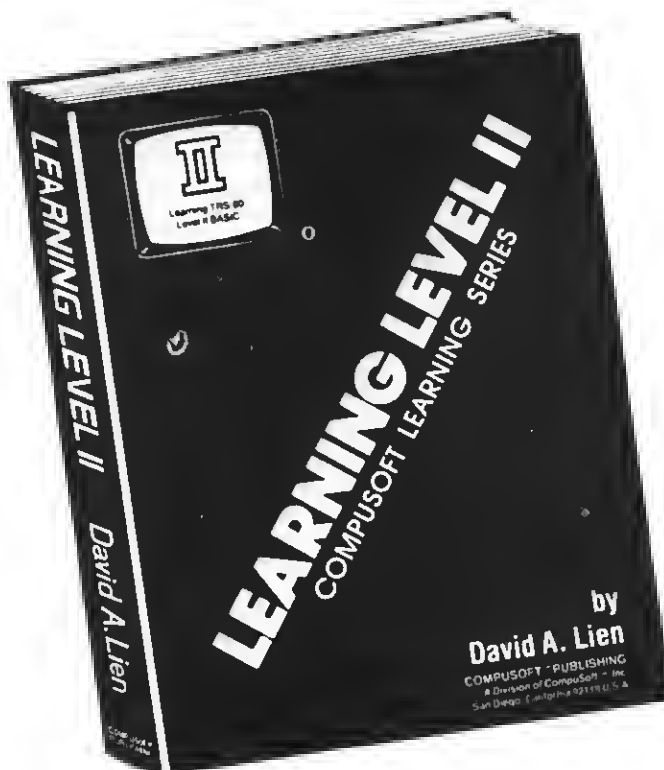
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Here's The Second Half



\$15⁹⁵
(soft cover)

Written by the author of your Level II Users Manual, **LEARNING LEVEL II** picks right up where the Level I Manual leaves off. It even supplies the changes needed to make the Level I Manual compatible with your Level II TRS-80.

LEARNING LEVEL II covers all Level II BASIC beyond Level I, plus much more. It shows you how to use the Editor, explains what the many error messages are really saying, and leads you thru conversions of Level I programs to Level II.

Dual cassettes, the Expansion Interface with Real Time Clock, use of printers and other features are explained in the same easy-to-learn style that made the Level I Manual famous. **LEARNING LEVEL II** was created specifically for your Level II TRS-80!

Yes, I want to LEARN Level II!

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Please send _____ copies of **LEARNING LEVEL II**. My check for \$15.95 each + \$1.45 P&H is enclosed. (CA addresses add 6% sales tax).

I understand my order will be shipped promptly and there is a 30 day money-back guarantee.

NAME _____
ADDRESS _____
CITY _____
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REVIEW

MICRODOS A Different Way To Do It

by John Culleton

The advertisement was enticing: "an advanced, easy-to-use operating system...works entirely with Level II BASIC commands". The product was produced by Percom, one of the better houses in our experience. So, a check was dispatched to Access Unlimited, Inc. and, rather quickly, the diskette and a slim instruction booklet arrived. On the diskette was a single monitor program which combines the essential features of an operating system and Disk BASIC, while occupying only 7K of memory. A unique and useful set of BASIC language utilities were also included — more about that later. With one very important exception, the software supplied duplicates the major functions of Radio Shack's TRSDOS and Disk BASIC. The exception relates to disk file access and is both the chief strength and principal drawback of MICRODOS.

Radio Shack's TRSDOS is the jumping-off point for most alternative operating systems. MICRODOS emulates several TRSDOS features. However, TRSDOS and Disk BASIC operate as distinct command levels, each with its own set of directives. Frequently, the TRSDOS user switches back and forth between levels to get to the appropriate command. By contrast, MICRODOS operates on only one level, which equates to the Disk BASIC level on a TRSDOS-based system. There are additional directives of the CMD "X" form to provide for such features as formatting a diskette, writing a copy of the operating system program onto a diskette and providing an automatic message at bootstrap time. The monitor program (written in machine language, not BASIC) stays in residence at all times.

Most of the features found in Radio Shack's Disk BASIC are replicated, using similar or identical coding conventions. On the positive side, there are familiar and useful features such as DEF, FNx, MID\$, the ten USR exits and so on. Most definitely on the negative side, the incredibly Mickey Mouse method of disk record formatting (remember LSET, CVD and all that jazz?) is imitated as well.

The one important difference lies in the management of disk space and the method of file access. TRSDOS manages the disk space for you, and does it rather well, thank you very much. (Naysayers and doubters are sentenced to spend six months struggling with the file mismanagement features of IBM's DOS, after which they will never again criticize any micro operating system!) In

TRSDOS, the physical addresses of files remain invisible. Files can be accessed by name only. Space is immediately released to the pool of free sectors upon execution of a KILL command. A file can be distributed over several non-contiguous extents (granules in TRSDOS terminology). Space allocation and expansion are completely automatic.

By contrast, MICRODOS does no management of physical disk space. The user can read and write to a specified disk sector, using a sector number in the range 0-399 (assuming a 40 track drive). A BASIC program is loaded and executed a command in the form LOAD DSSS, R with D equal to the drive number, SSS equal to the sector number, and R an optional parameter that calls for immediate execution. The operating system is just smart enough to load contiguous sectors, starting with DSSS, until an end of file marker is sensed. The system proper contains no file index. There is, however, an interesting utility program written in BASIC which replicates many of the functions of the DIR command. The file index must, of course, be manually posted by the user since the system does no disk space management at all. The DIR program and the other BASIC utilities are called by menu selection. Indeed, the utilities form an extension of the monitor so that functions such as FORMAT, BACKUP and COPY can be executed.

Where does this unique product fit in the world of TRS-80 software? This reviewer sees two potential user communities. MICRODOS was originally written for the use of BASIC-oriented software houses which might wish to economize on the amounts of diskette space and main memory allocated to system overhead. The operating system (less utilities) does indeed occupy only 7K of memory and one track of the diskette. The production version of a software package is easily configured as a "load and go" diskette which relieves the consumer of all concern with program startup. The non-compatibility of MICRODOS files, diskette formats, and file access methods might serve as a minor protection feature for a vendor's software although any persistent user could LIST and rekey the program with appropriate modifications to the file access routines. Under MICRODOS, the 16K disk system becomes practical, which could be a powerful selling point.

The other potential market lies in the large number of hobbyists whose programming knowledge does not extend beyond BASIC but who, nevertheless, want to experiment with creating or modifying their own system software. The utilities provided with the system do indeed give insight into simple implementation of operating system-type functions in a high level language. They are clearly written, with none of the symptoms of programming "gamesmanship" that some program authors regrettably delight in. It might indeed be good clean fun to extend and modify these functions and, in effect, customize the BASIC language part of the operating system software to suit personal preferences and prejudices. Although memory is cheap "nowadays" even the owner of a 48K maximum system might find himself running out of space for that ultimate version of "TREK". With MICRODOS, he can use 41K for his code, which should be enough for most of us.

Those of us who write in Assembler or in FORTRAN will find little use for MICRODOS. There is no facility for supporting these languages or the object code produced by their translators. MICRODOS is for BASIC freaks only. And Radio Shack's method of accessing data files, terrible to start with, is made a little worse by MICRODOS.

This writer has a variety of operating systems and variants available. Most day-to-day work is done under TRSDOS 2.3 as modified for 40 track operation by Percom's PATCHPAK program (PATCHPAK and MICRODOS are both the product of James M. Stutsman and he can play on our team any old time). MICRODOS will go on the rack next to RSM2D, DOS+ and the other special purpose software systems we use. It's unique, interesting, and may come in handy someday, although we don't put out much BASIC language code around here. It won't replace TRSDOS or the aforementioned special products which preceded it into our shop.

If BASIC is your thing, and if you need any of the special features of MICRODOS, or you have limited main memory, or you just plain want to fool around with disk utility writing, by all means give the package a try. The price (less than \$30.00 retail) makes it too tempting to resist.

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WHAT AN ACCOUNTANT DOES WITH A TRS-80

by James H. Sheats

One of the more commonly suggested uses for a microcomputer is the broad category of use referred to as 'accounting applications'. As an accountant and tax preparer, I thought that it might interest some of the readers to hear how I use the TRS-80 in my business.

My business consists of general ledger write-up and income tax work. I use an NCR magnetic ink encoder and a service bureau that provides a complete set of financial statements. I priced out an equivalent general ledger package for the TRS-80. The hardware requirement was three disk drives and a line printer with at least 96 characters per line. The software alone would cost about \$2,200.00. I don't intend to purchase this right away for obvious reasons.

I have attempted to use three different computerized tax preparation services. I can still see instances where a good tax service would be useful, but a large volume of returns is necessary to justify the time spent in learning rather complicated input procedures and forms of these services. However, I may try again with an income tax package for my TRS-80.

My own TRS-80 system has a 48K memory, a line printer, and two disk drives. I have an amortization schedule program which is useful year round since I share an office with two lawyers.

I wrote two payroll programs that begin with input hours and calculate gross pay, social security, federal and state withholding tax, and the new Advanced Income Credit. One of the programs uses DATA statements to input hourly wage rate, marital status, and dependent information for each employee. The other one uses INPUT statements for this. This latter is useful to me when a customer wants to know how much to deduct from an employee's paycheck and he has mislaid his charts.

I occasionally have to prepare depreciation schedules and other special explanatory schedules for customers' tax returns and other purposes. In most cases, the same format will be used every year for this particular customer with only the figures themselves changing. This situation is a 'natural' for the Electric Pencil; I use it extensively. Each customer's schedules are stored in a separate Pencil file. I also have purchased SCRIPSIT and intend to convert some of the Pencil files during the slack season.

I do not use a checkbook balancing program. I do many reconciliations every month and I have not found it difficult to perform this task the old fashioned way. Most 'home budget' programs are not adequate for my own needs although, if a customer walked in with a printout from one, I would probably use it in preparing his return.

My plans for the future include the purchase of one or more additional disk drives, a telephone interface, and some more software, including a really good general ledger package. These plans are made based on the needs of my bookkeeping and tax service as they exist now. Should other opportunities develop, I may make more extensive use of my TRS-80 to furnish other services to my customers, but I have no definite plans in this regard at present.

SUPERMENU for NEWDOS Users

by James Garon

Are you still suffering with the problems and downright errors of TRSDOS? Have you listened with awe and envy to the users of NEWDOS and NEWDOS+? This program is not designed to make you feel better. In fact, it is a BASIC program which CANNOT be run under TRSDOS. This is because it makes use of one of NEWDOS' special features: the ability to get a DIRectory while remaining in BASIC.

Once the DIRectory is on the screen (which is actually just another 1K of memory to the Z-80 chip), the program, called SUPERMENU, reads the list of programs from the screen and into an array. Each program is assigned a symbol (@, A, B, ..., Z) allowing up to 27 programs to be run with a single keystroke — even machine language programs! This is possible because NEWDOS can execute a machine language program from BASIC (if its name ends in ".COM"). SUPERMENU decides automatically whether to "RUN" or "CMD" a given program.

This whole process can be made even more automatic by typing (while in DOS):

AUTO BASIC RUN "SUPERMENU"

This requires, of course, that you also SAVE the program itself under the name "SUPERMEN" (The computer will ignore the "U" in the AUTO-command — but it looks nicer).

If you are willing to work a little harder, you can automate your whole program library. Take a look at one of your programs. If it has any END statements, change them to:

RUN "SUPERMENU"

If it has no END statement, then place: RUN "SUPERMENU" after the last line. Now SUPERMENU calls your program and your program returns to SUPERMENU!

Since SUPERMENU as written will create a single key DIRectory/menu for Drive 0, what do you do if you have two or more drives? Just change line 30 from ...CMD"DIR" to CMD"DIR:1" and save the new program under the name "DRIVE1". If you have the drives, save a program called "DRIVE2" with line 30 containing CMD"DIR:2" and so on (Each such program takes only one program). Now, when you press the RESET button, you will soon see a single-key menu of the programs on Drive 0. One of them will be called "DRIVE1". Press the letter next to "DRIVE1" and, PRESTO, you are soon gazing fondly at the programs on Drive 1!

TRSDOSers, eat your hearts out!

```
10 'SUPER-MENU BY JAMES GARON - DESIGNED FOR APPARAT DOS
20 'BASED ON AN IDEA BY DAVE WINTERS
30 CLS:PRINT@17,"* S U P E R M E N U *":CLEAR1E3:CMD"DIR"
40 PRINT@0,CHR$(30)TAB(25)"CREATING MENU":DEFINT H-Z:DEF STRA-G
50 DIMA(26):L=1:S=15464:P=851:Z=63:PRINT@128,;
60 FOR I=0 TO 26:K=I:H=20:R=I-3*INT(I/3):IFR=0:H=24
70 S=S+H:IF PEEK(S)=321:Z=26:L=0:GOTO 110
80 FOR J=0 TO 12:M=PEEK(S+J):IF M=32J=12:GOTO 100
90 A(I)=A(I)+CHR$(M)
100 NEXT J:PRINT TAB(20+R+5)CHR$(64+I)" "A(I):IFR=2:PRINT CHR$(29)CHR$(26);
110 NEXT I
120 PRINT@0,CHR$(191)CHR$(143)STRING$(60,131)CHR$(143)
    STRING$(2,191):FOR I=127 TO 959 STEP 64:PRINT@1,STRING$(2,191);
    NEXT I:PRINT CHR$(188)STRING$(60,176)CHR$(188):
    POKE 16383,191:PRINT@91,"- M E N U -";
130 IF K=0:PRINT@835,"NO VISIBLE PROGRAMS":FOR I=0 TO 1 STEP 0:NEXT I
140 PRINT@835,"SELECTION (@-"CHR$(64+K+(L=0))")":GOSUB 170
150 PRINT@P,BTAB(32)"STAND BY FOR "A(M);
160 IF RIGHT$(A(M),4)="/CMD":CMDA(M)ELSE RUNA(M)
170 Z=206-Z:PRINT@P,CHR$(Z):FOR I=1 TO 10:B=INKEY$
180 IF B=""NEXT:GOTO 170
190 IF B<"@ OR B>CHR$(63+K-(L=1))THEN 170ELSE M=ASC(B)-64:RETURN
```

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DEPRECIATION

by Daniel Miller, Astorla, NY

If you own your own small business, this program will help you complete Form 1040, Schedule C-2 'Profit (or Loss) From Business or Profession'.

The program calculates depreciation by the three following procedures:

- (1) Straight line;
- (2) Declining balance (125%, 150%, 200%);
- (3) Sum of the year's digits.

Before beginning, determine the adjusted basis (your actual cost) for the item. The adjusted basis is the total of your purchase price, money borrowed and the fair market value of services or property you provided.

Certain adjustments, e.g. transportation and installation costs, and outlays for capital improvements, will raise the adjusted basis; others, e.g. depletion allowances and casualty losses, will lower the basis.

(For a complete description of basis and depreciation, obtain I.R.S. Publication 17, 'Your Federal Income Tax'.)

If you use either the straight line or sum of the year's digits method, subtract from the basis the salvage value, i.e. the amount you believe you could get at the end of the item's useful life. This figure, the adjusted basis, will be used in the program.

Do not depreciate the item past its salvage value.

An item put into service by the fifteenth of the month is considered in use for the entire month. Otherwise it is not considered for depreciation until the following month. If an item has been used for the entire first year, enter '12'; if not, enter the appropriate number of months.

```

1 REM * STRAIGHT LINE DEPRECIATION *
2 REM ** DECLINING BALANCE DEPRECIATION **
3 REM *** SUM OF THE YEARS' DIGITS DEPRECIATION ***
4 REM *****
5 REM * DANIEL MILLER *
7 REM *****
9 CLS:RESTORE
10 M$="####,###.##"
20 PRINT"ADJUSTED BASIS OF PROPERTY:
(COST +/- ADJUSTMENTS - SALVAGE VALUE, IF NEEDED) - $ "; INPUT B
PRINT
30 INPUT"USEFUL LIFE OF PROPERTY (IN YEARS) - ";L:PRINT
35 M=L
40 INPUT"NO. OF MONTHS IN SERVICE (FIRST YEAR) ";M:PRINT
45 IF M<1 OR M>12 THEN40
50 PRINT:PRINT"WHICH TYPE OF DEPRECIATION:"PRINT"(1) STRAIGHT L
INE:"PRINT"(2) DECLINING BALANCE:"PRINT"(3) SUM OF THE YEARS' DI
GITS:"INPUT E
55 IF (E<1)OR(E>3) THEN50
60 PRINT IF E=2 PRINT"WHICH RATE OF DECLINING BALANCE:"PRINT"(1

```

```

) 1 25":PRINT"(2) 1.50":PRINT"(3) 2.00":INPUT V:IF (V<1)OR(V>3)
THEN60 ELSE FOR C=1TOV READ D:NEXT C
70 DATA 1.25,1.50,2
80 CLS
90 ON E GOTO 100,110,120:'FOR ITEM USED ALL 12 MONTHS FIRST YEAR
100 PRINT"STRAIGHT LINE:"
105 GOTO125
110 PRINT"DECLINING BALANCE:"
115 GOTO125
120 PRINT"SUM OF THE YEARS' DIGITS "
125 PRINT
150 GOSUB6000
160 Y=0
172 Z=1
175 IF M<12 GOTO1000:'IF ITEM USED LESS THAN 12 MONTHS DURING T
HE FIRST YEAR
180 D1=B/L
190 H=B/(L*(L+1)/2)
200 Y=Y+1
210 ON E GOTO 300,400,500
300 REM * STRAIGHT LINE METHOD *
310 B=B-D1
320 PRINTY,
325 PRINTUSING M$,D1, PRINT" ", PRINTUSING M$,B
328 Z=Z+1 IF Z=11 INPUT"PRESS -ENTER- TO CONTINUE ";A$:CLS:IF Y=
N THEN 335 ELSE GOSUB 6000:Z=1
330 IF Y<L THEN200
335 GOTO 10000
400 REM ** DECLINING BALANCE **
410 D4=B*(D/L)
420 B=B-D4
430 PRINTY,
435 PRINTUSING M$,D4, PRINT" ", PRINTUSING M$,B
438 Z=Z+1 IF Z=11 INPUT"PRESS -ENTER- TO CONTINUE ";A$:CLS:IF Y=
N THEN 445 ELSE GOSUB 6000:Z=1
440 IF Y<L THEN200
445 GOTO 10000
500 REM *** SUM OF THE YEARS' DIGITS ***
510 G=L-Y+1
520 D6=G*M
530 B=B-D6
540 PRINTY,
545 PRINTUSING M$,D6, PRINT" ", PRINTUSING M$,B
548 Z=Z+1 IF Z=11 INPUT"PRESS -ENTER- TO CONTINUE ";A$:CLS:IF Y=
L THEN 555 ELSE GOSUB 6000:Z=1
550 IF Y<L THEN200
555 GOTO 10000
1000 ON E GOTO 2000,3000,4000:'IF ITEM USED LESS THAN 12 MONTHS
DURING THE FIRST YEAR
2000 Z=1:'STRAIGHT LINE METHOD
2005 D2=(B/L)*(M/12)
2010 Y=Y+1
2020 B=B-D2
2030 PRINTY,
2035 PRINTUSING M$,D2, PRINT" ", PRINTUSING M$,B
2040 D1=D2*(12/M)
2045 Z=Z+1
2050 GOTO200
2060 END

```

```

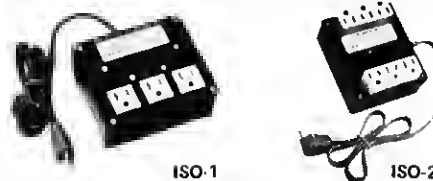
3000 Z=1:DECLINING BALANCE METHOD
3005 D5=((D/L)*B)*(M/12)
3010 Y=Y+1
3020 B=B-D5
3030 PRINTY,
3035 PRINTUSING M$:D5,PRINT" ",PRINTUSING M$:B
3040 L4=D5*(12/M)
3045 Z=Z+1
3050 GOTO2000
3060 END

4000 Z=1:SUM OF THE YEAR'S DIGITS METHOD
4001 H=B/(L*(L+1)/2)
4002 Q=(L*(L+1)/2)
4003 Y=Y+1
4005 G=L-Y+1
4010 D7=(G*H)*(M/12)
4020 B=B-D7
4030 PRINTY,
4035 PRINTUSING M$:D7,PRINT" ",PRINTUSING M$:B
4040 D8=((D7*(12/M))*(12-M))
5000 Z=Z+1
5005 Y=Y+1
5010 D9=(D8*(W/Q))*((12-M)/12)+(D8*((W-1)/Q))*(M/12))
5020 B=B-D9
5030 PRINTY,
5035 PRINTUSING M$:D9,PRINT" ",PRINTUSING M$:B
5038 IF Z=10 INPUT"PRESS -ENTER- TO CONTINUE ";H$CLS:IF Y=L THE
N 5050 ELSE GOSUB 6000:Z=1
5040 W=W-1
5045 IF Y<L THEN5000
5050 GOTO 3000
6000 PRINT"END OF YEAR","DEPRECIATION","PRESENT VALUE":PRINT:RET
URN
6050 END

10000 PRINT:INPUT"ARE THERE ANY MORE ITEMS TO DEPRECIATE ";Q$
10010 IF LEFT$(Q$,1)="Y" THEN CLS:RESTORE GOTO 30
10020 PRINT:END

```

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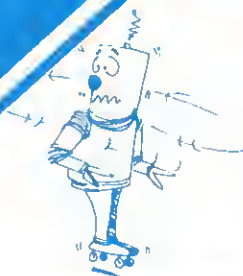
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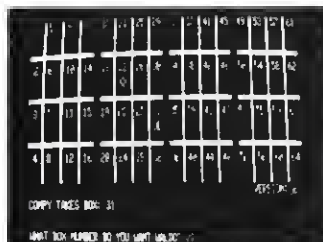
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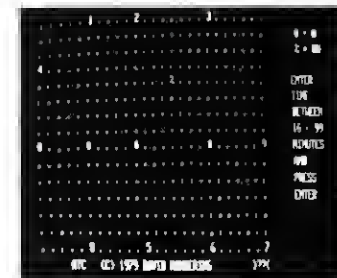
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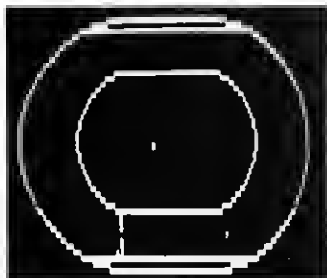
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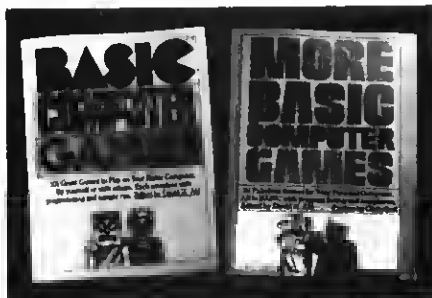
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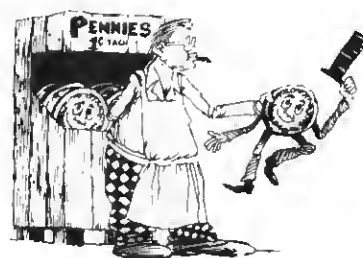
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PEEK and POKE

From "Learning Level II" by David Lien

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PEEK and POKE are BASIC words that allow us to do non-BASIC things. They provide the means whereby we can PEEK into the innards of the computer's memory, and if we wish, POKE in new information.

It is not our purpose here to become an expert in machine language programming, or even on how the computer works. We have to approach this and related topics a little gingerly lest we fall over the edge into a computer abyss (or is it an abysmal computer?).

We do know, however, that computers do their thing entirely by the manipulation of numbers. Therefore, when we PEEK at the contents of memory, guess what we'll find? Numbers? Very good! (Ummmyass).

INSERT FIGURE 1.

Decimal Address		Hex Address
65535	END "48K" SYSTEMS	FFFF
49151	END "32K" SYSTEMS	8FFF
32767	END "16K" SYSTEMS	7FFF
20479	END "4K" SYSTEMS	4FFF
	RESERVED WITH MEM. SIZE OPTION	
	STRING SPACE	
	STACK	
	FREE MEMORY	
	ARRAYS	
	SIMPLE VARIABLES	
	BASIC PROGRAM TEXT	
17129		42E9
	I/O BUFFER	
16870		41EC
	RESERVED	
16429		402D
	LINE PRINTER DCB	
16421		4025
	VIDEO DCB	
16413		4010
	KEYBOARD DCB	
16405		4015
	BASIC VECTORS (RST's 1-7)	
16384		4000
16383	VIDEO MEMORY	3FFF
15360		3CDD
15359	RESERVED FOR MEMORY-MAPPED I/O	38FF
12288		3001
12287	LEVEL II ROM	3000
0		0000

Figure 1. Level II Memory Map

As you can easily see from the Memory Map in Figure 1, large chunks of the computer's memory are set aside, or "mapped" for very specific uses. (Oh, you can't see it easily...? Had your eyes checked lately?) The Level II ROM for example, uses byte address 0 through 12287. All numbers we talk about here are decimals, not hex, octal, binary or Sanskrit.

Type in this program:

```
20 N=0
50 PRINT N, PEEK(N), CHR$(PEEK(N))
60 N=N+1
70 GOTO 50
```

Let's analyze the program before RUNning it.

Line 20 sets the beginning address where we want to start PEEKing. As Figure 1 shows, there are lots of good places to go spelunking, and we can change line 20 to start wherever we want.

Line 50 prints three things:

A. The address — that is, the number of the byte, the contents of which we are PEEKing at.

B. The contents of that byte, expressed as a decimal number between 0 and 255.

C. For convenience (and some value), the contents of that address converted to its ASCII character. (Many of the ASCII characters are not printable — we warned you it was a ribald novel.) Go back to the chapter on ASCII if your memory has grown dim.

OK, now RUN the program, being ready to stop it with SHIFT@ if you see something interesting. It can also be stopped at any time with the BREAK key, and restarted with CONT without having to start all over again with N at 0.

Didn't see anything interesting? What did you find starting at address 261??? You have to be able to read vertically as the letters swish by.

When the letters jump to double width, hit STOP, then CLEAR, then CONT, as they are too hard to read when so large. Change N to start at different places in memory and PEEK to your heart's delight. You can't goof up anything by just PEEKing. It's indiscriminant POKEing that gets you into trouble.

The command level is very handy for resetting the starting address. Change the value of N by just typing:

```
N=5000
    for example, then
CONT
    instead of RUN
```

When done PEEKing with this program and having seen far more information than can possibly be absorbed, rework line 50 to read simply.

```
50 PRINT CHR$(PEEK(N));
    and RUN.
```

It PRINTs only the ASCII characters, horizontally, and is the ideal program to RUN when friends visit. Just act casual about the whole display and avoid any direct questions. Makes a great background piece for a science fiction movie.

When you find an interesting spot, hit BREAK, then
PRINT N

at the command level to find out where in
memory you are PEEKing. (Don't you wish you
could explore the corners of your mind as
easily?)

CONTINUE on when ready.

Having moved from PEEKing to leering, it's time to
see what else we can do.

Careless POKEing can leave holes...

Before POKEing, we'd better see that we're not
POKEing a stick into a hornet's nest. It's with the
greatest of ease that we destroy a program in
memory by POKEing around where we shouldn't.

Obviously there is no use POKEing in the ROM area
since ROM stands for Read Only Memory. It's not
changeable. The rest of the "Memory mapped"
area, from 12288 through 17129 is reserved for
specific things, so best not to POKE in there while
we're just bungling around. Anything above 17129
should be available memory, unless taken up with
our BASIC program or required for processing.
With such a short program as ours we surely can't
goof anything up. Can we?

Let's PEEK around 20000 and see if anything is
going on there. Change two program lines to:

```
20 N = 20000
```

```
50 PRINT N; PEEK(N),
```

```
and RUN
```

20000	255	20001	255	2002	255	20003	255
20004	255	20005	255	20006	255	20007	255
20008	255	20009	255	20010	255	20011	255
20012	255	20013	255	20014	255	20015	255
20016	255	20017	255	20018	255	20019	255
20020	255	20021	255	20022	255	20023	255
20024	255	20025	255	20026	255	20027	255
20028	255	20029	255	20030	255	20031	255
20032	0	20033	0	20034	0	20035	0
20036	0	20037	0	20038	0	20039	0
20040	0	20041	0	20042	0	20043	0
20044	0	20045	0	20046	0	20047	0
20048	0	20049	0	20050	0	20051	0
20052	0	20053	0	20054	0	20055	0
20056	0	20057	0	20058	0	20059	0
20060	0	20061	0	20062	0	20063	0

What we see are the address numbers and their
contents, in easy-to-read parallel rows. Unless
you've been messing around with other programs
since power-up, you should just see nice rows of
255's and 0's. The memory at this location is not
being used.

Great! Let's change our program and POKE in some
information and do something with it. Make it read:

```
10 REM * POKE PROGRAM *
```

```
20 N = 20000
```

```
40 READ D
```

```
50 POKE N,D
```

```
60 N = N+1
```

```
70 IF N = 20011 END
```

```
80 GOTO 40
```

```
100 DATA 80,60,69,75,45,65,45,66,79,79,33
```

Before RUNning, let's analyze it.

Line 20 initializes the starting address at 20000

Line 40 READs a number from the DATA line

Line 50 POKEs the DATA "D" into address "N"

Line 60 increments the address number by one

Line 70 ENDS execution when we have POKEd in all
11 pieces of DATA

Line 80 sends us back for more DATA

Line 100 stores the DATA we are going to POKE into
memory.

Now = RUN

Well, that was sure fast. I wonder what it did? How
can we find out? Should we PEEK at it? Yes, but let's
leave the old program in and just start a new one at
200.

```
200 REM * PEEK PROGRAM *
```

```
210 FOR N=20000 TO 20010
```

```
220 PRINT N, PEEK(N)
```

```
230 NEXT N
```

```
and RUN200
```

```
20000 80
```

```
20001 69
```

```
20002 69
```

```
20003 75
```

```
20004 45
```

```
20005 65
```

```
20006 45
```

```
20007 66
```

```
20008 79
```

```
20009 79
```

```
20010 33
```

How about that. We really did change the contents
of those memory locations. We shot the numbers
from our DATA line right into memory. Now if we
only knew what those numbers stood for.
Wonder...if we changed them to ASCII characters,
would they tell us anything?

Add:

```
205 CLS
```

```
220 PRINT@470+N-20000,CHR$(PEEK(N));
```

to print at a certain location on the screen and
RUN200

Print The Results Here



And that's how PEEK and POKE work.



BOOK REVIEW — TRS-80 PROGRAMS

by A.A. Wicks

Published under the aegis of Radio Shack, a beginner-oriented book, 'TRS-80 Programs', provides 32 BASIC programs written especially for the TRS-80 computer, and, as the preface states, 'They will work!'

The authors, Tom Rugg and Phil Feldman, have provided a most thorough and interesting text, in addition to the program. Following some explicit instructions on how to use the book in order to gain the most usefulness from it, each section

has a preface and each program has a detailed preamble. The latter covers the purpose of the program, how to use it, and a sample run. This is followed by at least one video presentation of the program in operation. In most instances, typical sample runs are also provided. In the event that the user's display does not reflect the one shown, instructions are given as to what steps to take to correct the problem.

The book has been written so that no knowledge of programming or BASIC is required—merely type in the programs, and 'run'. However, because of the extensive text that follows each program listing, anyone wishing to learn more about programming in BASIC will be helped considerably.

Sections titled 'Easy Changes', and then 'Main Routines', which provide a break down by line number of the program logic and what each major portion of the program accomplishes, are excellent. In addition, a list of the Main Variables is included for reference. One more section for each program, 'Suggested Projects', provides a challenge for anyone wishing to go further, learning more about BASIC as they go.

And what of the programs? In general, a good selection of not less than four, and not more than six each, in the groupings of Applications, Educational, Games, Graphics Displays, Mathematics, and several short miscellaneous programs. A very few of some have been released commercially but otherwise have not been published, although there are similarities to other programs, e.g., 'Biorhythm'. The programs are designed to run on a 16K level II machine, but most will load within 4K without modification. Suggestions for restricted-memory loading are included. Wherever possible, full advantage is taken of the TRS-80 graphics, and tabulated displays are neat. None of the programs is extremely complex either in programming or subject matter, and their greatest value probably is in their potential for programming instruction. Nevertheless, the other side of instruction, the educational programs, are ideal for grade school (or pre-school!) guidance. And the business and mathematical programs can be very useful. The mathematics programs primarily cover higher mathematics and would be useful for students, engineers, and statisticians, with extensive use being made of graphs.

The printing quality of the listings is excellent—a credit to the production department and the printer—dilithium Press, of Portland, Oregon. The listings are of dot-matrix origin, but are sharp, well-inked black, and, for instance, leave no doubt regarding commas or periods. Print size is about 10-point typewriter size, and slightly larger than the text, although this may be an impression gained from the different type style of the text.

The cost of the book is reasonable—\$5.95; it is available at Radio Shack stores, Catalog No. 62-2064. It is recommended for good entertainment, practical applications use, and programming skills improvement.

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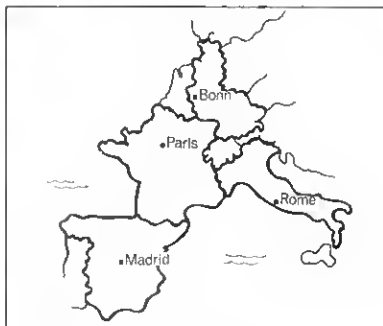
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WHAT'S HAPPENING?

(with the "Original" TRS-80® Users Journal)

Our Mar-Apr 80 issue tells about how one person improved the resolution on the '80 by a factor of 6! The photo on the cover of that issue tells the story. There is also a complete listing in BASIC of a disk-based file system, using random files and hash codes. Also in BASIC is a program that compares dollar values between any years from 1881 to 1980, and it gives comparative cost figures for housing, transportation, food, etc. (it is in L2 16K). In the "fun and games" department, there is a complete BASIC listing of a game where you play nine games of tic-tac-toe at the same time - the computer is your opponent. In the utilities department there are two methods of creating graphs, a program to give you a HEX dump of

memory, and - a program to give you number conversion from decimal/octal/hex/binary. In assembly language, there is a complete listing which allows you to selectively scroll any portion of the screen, while leaving the rest of it intact! Plus, there are the regular features: A tutorial on the Editor/Assembler for beginners; New Products; Reviews and the Business Section. It isn't called the "TRS-80 Users Journal" for nothing! It is published regularly every two months, and costs just \$16.00 per year in the U.S. Get a sample current issue (first class mail) for just \$3.00. Use your VISA or Mastercharge and call (206) 475-2219 today! Or, send check or Money Order to: 80-U.S. Journal 3838 South Warner Street, Tacoma, Washington 98409

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